BEEBOX, OCEANPORTAL, OCEANTEACHER AND OTHER IOC VENTURES INTO NEW TECHNOLOGIES

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ABSTRACT: For some years now the IOC has been involved in the development of Internet based information services. This started with the IOC and IODE web sites in 1995, followed by the Global Directory of Marine (and Freshwater) Professionals in 1997. In parallel IODE redefined its capacity building strategy basing it upon linking equipment, training and operational support. This strategy was implemented as from 1998 through the ODIN (Ocean Data and Information Networks) projects. To effectively implement the training component of these projects it was decided to develop a standard data and information management training curriculum. This led to the building of the OceanTeacher system of training tools for oceanographic data and information management and exchange. It was also recognized that users increasingly have problems locating relevant information on the Internet due to the volume of information available. This led to the development, in September 2000, of the OceanPortal, a high-level directory of and search engine for Ocean Data and Information related web sites. The most recent IODE technology development is the BeeBox software. Realizing the need for an affordable dynamic content management system that will enable small specialized communities to jointly build a web presence, IOC developed the BeeBox software. The software is open source and thus freely available. It includes features such as multiple authoring, e-library, discussion forum, subscription to content (push technology), massmail, etc."

KEYWORDS: information management, content management, training, distance learning, directories, portals

Introduction

The Intergovernmental Oceanographic Commission of UNESCO (IOC) was established in 1960 within the United Nations Educational, Scientific and Cultural Organization (UNESCO). In 1961 IOC established the International Oceanographic Data and Exchange Programme (IODE) to "enhance marine research, exploitation and development by facilitating the exchange of oceanographic data and information between participating Member States and by meeting the needs of users for data and information products." IODE has developed into a worldwide service-oriented network consisting of

DNAs, NODCs, RNODCs and WDCs (see figure 1). During the past 40 years, IOC Member States have established over 60 oceanographic data centres in as many countries.

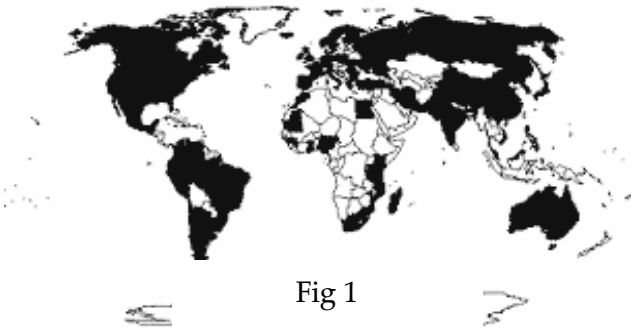


Fig 1

The main programme tasks of IODE can be summarized as follows: (i) to facilitate and promote the exchange of oceanographic data and information; (ii) to develop standards, formats and methods for the global exchange of oceanographic data and information; and (iii) to assist Member States to acquire the necessary capacity to manage oceanographic data and information and become partners in the IODE network. IODE aims to achieve these goals through advice from its groups of experts and its projects. The IODE Groups of Experts now include (i) the IODE Group of Experts on Technical Aspects of Data Exchange (GE-TADE); (ii) the IODE Group of Experts on Marine Information Management (GE-MIM); and (iii) the IODE Group of Experts on Biological and Chemical Data Management and Exchange Practises (GE-BCDMEP). Global IODE Projects include GODAR, GTSPP, marineXML, MEDI, OceanExpert, OceanPortal, OceanTeacher, USSSDAP, and OIT. IODE furthermore collaborates in various other projects such as ASFA and cooperates with other programmes and organizations including GOOS and JCOMM.

From its inception, IODE has always had an extensive capacity-building programme assisting member states with the establishment and maintenance of National Oceanographic Data Centres (NODCs) and Marine Information centres. This support used to be limited to occasional training courses, provision of some equipment, or support for internships. Since 1989, however, IODE has developed a totally different concept: the linking of equipment, training and operational support. This led to the development of the 'Ocean Data and Information Network' strategy, implemented in projects such as ODINAFRICA (2000-…) and ODINCARSA (2001-…).

In recent years the IODE Programme has started the development of a number of Marine Information Management products and services. We will focus on these products and services in this paper.

OceanExpert

OceanExpert started as the Global Directory of Marine (and Freshwater) Professionals (GLODIR) in 1997 (logo: Fig 2) after the IODE Group of Experts on Marine Information Management (GE-MIM) had noted that the International Directory of Marine Scientists project, developed and maintained in the 1970s and 1980s by several UN agencies had been stopped despite its high appreciation by the ocean research community. The first version of the new GLODIR was launched in 1997 as a web product enabling experts to enter and edit their information. Whereas the first version used the full ASFA subject descriptor set to enable experts to define their expertise, this was quickly dropped as experts showed little enthusiasm to spend the time required to pick descriptors from this extensive list. It was therefore decided to use a far more limited list of subject descriptors. In 1999 a number of IASMLIC members agreed to cooperate in GLODIR as national or regional 'input coordinators'. This led to a rapid increase (doubling!) in the number of entries and GLODIR passed the point of 10,000 records at the end of 1999. At that time we decided to add the citation field enabling experts to include short descriptions of their most important and/or recent scientific publications. This also proved to be a success as within a year over 15,000 citations were added.

Fig 2

Once a year all experts registered in GLODIR received an e-mail inviting them to update their record. On average 30-40% of the experts responded to this request. A big problem turned out to be the password required for editing records: in many cases the registered experts forgot this password and needed to obtain it from us.

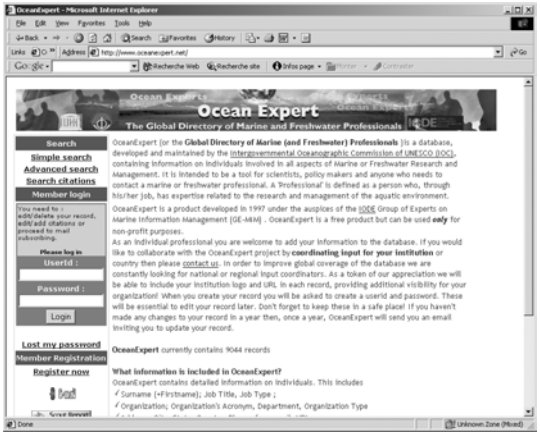
Another problem was experts who had not provided an e-mail address (or who had been registered by the national/regional coordinators without an e-mail address): although we attempted to send out printed update requests to over 3000 experts this proved to be an impractical, expensive and time consuming exercise that could not be maintained. By the year 2002 the number of records reached 13,500, of which 3000 did not have an e-mail address.

Early in 2002 we assessed the need to re-engineer GLODIR. We found that the technical solution on which GLODIR was based until then (Filemaker database served over the internet with Lasso as middleware) had reached its limits with response times of up to 2 seconds. In addition the mailing function of GLODIR (sending out e-mail to all or part of GLODIR addresses) caused crashes or serious slowdown of the server when the number

of addressees exceeded 1000. It was therefore decided to migrate GLODIR to a more robust and flexible solution. A contractor was hired to re-engineer GLODIR during the summer of 2002. We specified the following new features: (i) easy registration with 'forgot my password' function that e-mails the forgotten password; (ii) enable registered expert to send e-mails to others in the same country and/or with the same research interest ("community subscribe" function to receive such mails and "community mail" function to send such mails); (iii) citation alert: to receive an e-mail alert when an expert with your research interest submits a citation. In addition, to respond to the request to also provide a 'directory of research institutions' the system now uses a 'controlled' institution list whereby new experts can choose from a list of institutions previously entered.

The technology solution chosen is based on the open source mySQL database management system and PHP programming language. Last but not least we decided to rename GLODIR to a more intuitive 'OceanExpert' and we registered the domain name www.oceanexpert.net. The new OceanExpert (Fig 3) is being launched officially on 1 November 2002. We also removed the 3000 addresses that do not have an e-mail address.

Fig 3

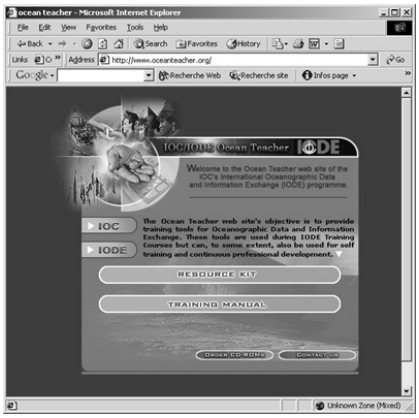


OceanPortal

Although a wide variety of web site directories and search engines exist, many of these do not provide sufficient detail or subject specificity. In addition the level of 'noise' (i.e. number of query responses that are not relevant) is high. It was therefore decided by the IODE Committee during its 16th Session (October/November 2000) to develop an 'OceanPortal' that will focus on 'ocean research and services' web sites: OceaPortal is therefore a high-level directory of Ocean Data and Information related web sites.

Fig 4

Fig 5



Its objective is to help scientists and other ocean experts in locating ocean data and information. Anyone can submit a new URL, suggest modification of an existing link or report a broken link. A chief editor (Dr Murray Brown) is responsible for verifying and validating submissions. The web sites are subject categorized in 15 main categories (Topical Sites/Education; Data Catalogs; Online Data Servers; IODE/ World Data Centers; Ocean Libraries; Publications/ Communications; Expertise; Research Vessels; Tools & References; Projects/ Agencies/ Institutes; Meeting/ Event Calendars; Associations/ NGOs; Protected Areas/ Aquariums; Abstracts/ Bibliographies; Commercial Equipment/ Services) and a total of 184 sub-categories.

OceanPortal is available through the URL http://www.oceanportal.org (Fig 4). On 1 September 2002 OceanPortal described more than 3200 sites. We receive about 30-50 new submissions per month.

Whereas OceanPortal was initially conceived as a web directory only, we quickly realized that we would considerably increase the usefulness of the service if we could also provide a specialized search service that would be able to search the registered web sites. We therefore implemented a webcrawler/indexer (Texis' Webinator) that visits all registered sites and indexes their content (html, word, PDF, php) down to level 3 (root and down to 2 levels below) once a month. The crawler/indexer thus visits and indexes over 550,000 documents.

OceanTeacher

Although capacity building has been one of the core activities of IODE since its creation in 1961, the programme never developed a standard training curriculum in ocean data and information management. An attempt was made in bringing together software tools in the early 1980s called 'OceanPC'. This however was more a 'toolbox' rather than a training curriculum. The recent development of the ODIN concept brought about the real development of a standard curriculum.

OceanTeacher can be defined as a standard curriculum and training system for Oceanographic Data and Information Exchange. It is intended to be used during IODE Training Courses but is also suitable for self-training and continuous professional development. OceanTeacher has two main sections: (i) the IODE Resource Kit; and (ii) the Training Manual. Under each section there is a module on ocean data management and a module on marine information management.[1]

The Resource Kit contains a range of marine data and information management materials such as software tools, quality control and analysis strategies, training manuals and relevant IOC documents. The data management module of the Resource Kit has three major sections: (i) 'The IODE Data Centre System' (what is a data centre, global programmes, science plans, data policy, reference library); (ii) 'Data Management Systems' (computer systems, database technology, metadata, data collection, quality control, the internet, GIS); and (iii) 'Data Analysis & Products' (formats, data, software, classroom, data products).

The Training Manual contains a collection of outlines, notes, examples, and miscellaneous documents used mainly in conjunction with the Resource Kit to organize training courses in marine data and information training. The marine information management module of the training manual currently contains two 'courses': (i) Course 1: basic introduction to marine information management, information concepts;

[1] At the time of publication of this paper only the training manual is available for marine information management. For data management both the resource kit and training manual are available.

information software and technology and the organisation of the collection using a defined integrated library management system; (ii) Course 2: advanced applications of I.L.M.S; creation of research support services and information seeking and retrieval particularly in the electronic environment

The ODIN capacity building concept links training, education and operational support. As such, students who attended a course are given tasks to complete once returned home. Lecturers are available for assistance by e-mail and a coordinator is contracted to follow-up the tasks with the students. Within the framework of ODIN projects (such as ODINAFRICA) hardware, software and operational financial assistance is also provided to the participating institutions (data and information centres).

In order to manage and further develop OceanTeacher an IODE Steering Group for the OceanTeacher project has been established. This Group includes the training coordinator as well as authors who contribute material to OceanTeacher. Additional authors are invited to contribute material. OceanTeacher currently contains nearly 20,000 files.

OceanTeacher is available on the web through URL http://www.oceanteacher.org as well as on CD-ROM. The CD-ROM is available free of charge from the IOC/IODE Secretariat. (e-mail: g.reed@unesco.org)

OceanTeacher has been recognized as an excellent training system by other programmes and organizations (e.g. GOOS, JCOMM) and collaborative arrangements are being established to expand the focus of OceanTeacher to include modules to these other programmes and organizations.

BeeBox

The IODE system is a family of over sixty data and information centres in as many countries. The IODE programme implements a wide range of activities at the national as well as regional and global level. In order to report on these activities as well as to share experience, the IODE programme developed a web site as early as 1995. However, it was found that static web sites and the technology available to maintain such sites did not really allow for a 'community' approach to web publishing. In addition, users had to visit the site regularly to find out what was new. It was felt that a management system was required that should respond to the following requirements : (i) all community members should be able to submit content; (ii) we should be able to have several editors; (iii) we should have an easy to use tree structure; (iv) we should be able to combine text, links to documents, links to web sites and start discussions; (v) we should be able to inform users about new content; (vi) the technology solution should be low-cost and flexible. The IOC/IODE Secretariat undertook a survey of available solutions during 2001 and found that technology was mostly very complex and/or expensive (commercial product prices ranged from US$ 30,000 to US$200,000). We therefore started searching for open-source solutions that, if not fully responding to our requirements, would be affordable and could be further developed in-house. We found such a product and launched a first version of the new IODE web site in June 2001 (Fig 6). In order to further develop the software to

our requirements we contracted the developer and we hired our own developer (Benjamin Sims) to further develop and fine-tune the solution. This resulted in BeeBox.

Fig 6

BeeBox (logo Fig 7) is defined as an open source application for the development of Community portals. Its architecture allows multiple authors to submit content. The system further allows multiple administrators who can validate submitted content prior to publication (see below). The system uses easy WYSIWYG (What You See Is What You Get) interfaces for content input. The dynamic content management system used by BeeBox enables visitors to see easily what is new in the site as the homepage lists new items added in the different categories. Content is organized in the site by 'categories' defined by editors and administrators. Under a category sub-categories can be defined. Content within a category or sub-category is then either textual content, reference to e-documents, reference to web sites, reference to discussion for a category, or reference to an activity (calendar item). In addition registered users receive e-mail alerts on newly added (and validated) content.

Fig 7

BeeBox is based upon open source technology including mySQL and PHP. As such IOC can offer the solution free of charge. BeeBox is currently being used for various IOC and IOC/IODE web sites, all hosted in Paris. IOC/IODE will continue to further develop the solution and will provide support to other 'clients'.

Fig 8 shows the homepage of the IODE web site. Note the possibility to add 'quick link' buttons that lead to other sites or sections within the site. BeeBox is provided with its own search engine (searches content of the site). BeeBox uses an expanding explorer-

type navigation system (left side of the homepage). BeeBox can also be installed with a simpler non-expanding menu system, either vertical or horizontal. In the content 'frame' you will notice a 'banner' which is created by the administrator. Different banners can be defined that are displayed at different dates (e.g. different banner every month or specific banner announcing major event).

Fig 8

Below the banner, new content is displayed. For each 'item' a short summary is displayed. Users can click on 'read more' to see the full content. On the right side of the page an event calendar is displayed. Each item is hot-linked to an internal page (within the site) or external URL where more details on the event can be obtained. In addition, below the events frame you will find 'news' and 'links' sections.

Figure 9 shows the administrator home page. BeeBox allows for several levels of 'administrators', each with their own access rights as well as 'writers'. A writer can submit content for specific categories. An editor (administrator level 2) can create all types of content and also validate content submitted by writers. Higher level administrators will also be able to create banners, create and manage forums, administer members and look at visit statistics.

Fig 9

BeeBox uses the ‘knowledge type’ concept: information can be of different types: it can be text (like an ordinary web page), a ‘link’ to another web site, an ‘activity’, an e-document; or a discussion forum. This structure is available for any category (Figure 10 shows such a structure for the ‘category’ IODE-XVII). In addition BeeBox allows cross-links between categories. BeeBox can handle unlimited numbers of categories and sub-categories.

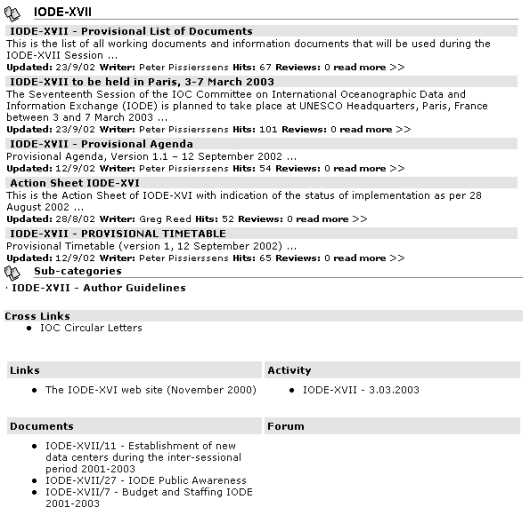
The result is that all content types related to a topic are put together in one page so users can have a clear overview of all information available.

Pages can also be easily printed (print button) and even e-mailed to a colleague or friend (the e-mail message will include a personal note and a URL link to the page).

Another core function of BeeBox is the ‘alert’ and ‘subscribe’ functions. The alert function makes that all registered members will automatically receive an e-mail alert message whenever new content is added to the site. This is a really important feature increasing ‘repeat visitors’ spectacularly. The ‘subscribe’ function is very similar to the ‘alert’ function but will enable members to decide themselves for which categories they wish to receive an alert. This will be useful when the site gets large and/or the content becomes very varied.

BeeBox also allows for multiple language content management: content can be submitted in multiple languages and visitors can select the language in which they wish to read the content.

Fig 10



The next version (planned end of 2002) will include the following updates and upgrades: (i) mailing list function; (ii) improved statistics; (iii) shrinkwrap version (easy install); (iii) easy version update; (iv) easy customization of home page components (modular homepage structure); (v) different menu display options ; (vi) Different 'themes' (colors and designs); and (vii) cross-site posting (enabling 'harvesting' of content from other BeeBox sites). The new version will make it easier for 'clients' to use their own designs and own 'themes'. The new version will be made available for download from the IOC/IODE web site as well as on CD-ROM. BeeBox is provided with a User and Administrator manual as well as Technical manual. Currently these manuals are available in English only but they could be translated into other languages if there is a demand.

[Mazatlan, 11 October 2002]